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GB 0481768 A GB 0384810 A EP 0416539 A
EP 0217265 A

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(54) Wheelchair access system for vehicles

(57) A ramp to afford wheelchair access particularly to a taxi cab or private car includes a ramp member (12a) with a foldably connected extension (13) which normally forms part of the floor structure adjacent to the doorway, is pivotally connected to the floor structure and normally housed in an upwardly open recess (11) formed in the floor structure (10) adjacent to the doorway. When unfolded the sloping lower face of the recess (11), the upper face of the ramp member (12), and the extension (13) form a continuous ramp extending from the interior of the vehicle, through the doorway and to the ground, the recess then providing increased headroom in the doorway. Alternatively the recess may comprise a closure member formed by a part of the floor, the closure member dropping down when the ramp is deployed to provide the increased headroom (Figs 3a - 3c, not shown).

FIG 1a

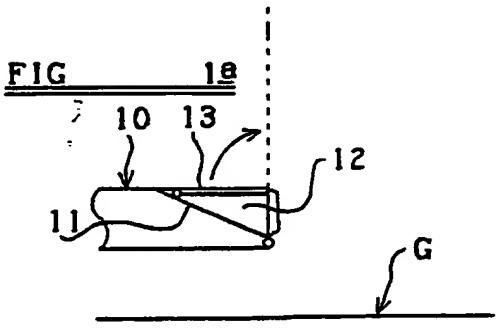

FIG 1c

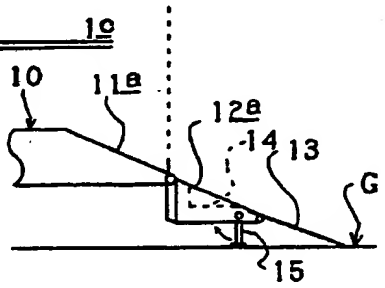

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FIG 1a

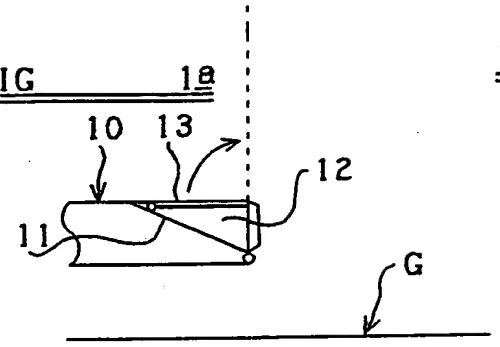


FIG 1b

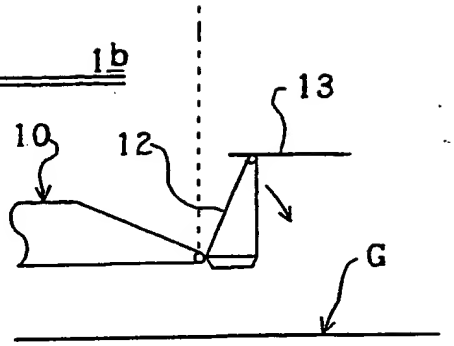


FIG 1c

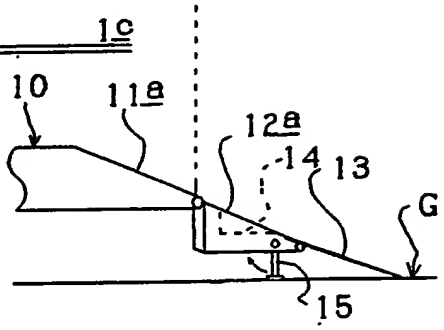


FIG 2a

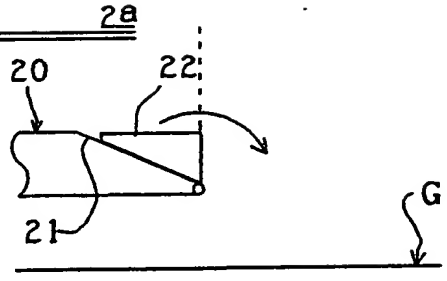


FIG 2b

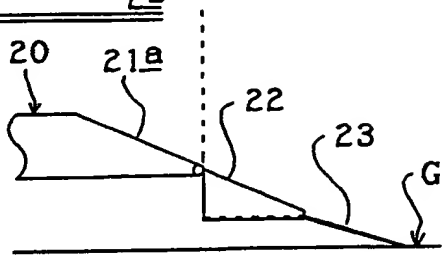


FIG 3a

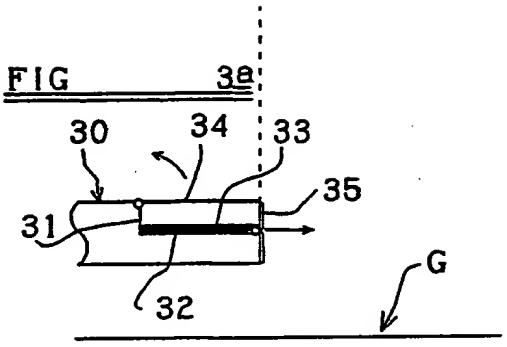


FIG 3b

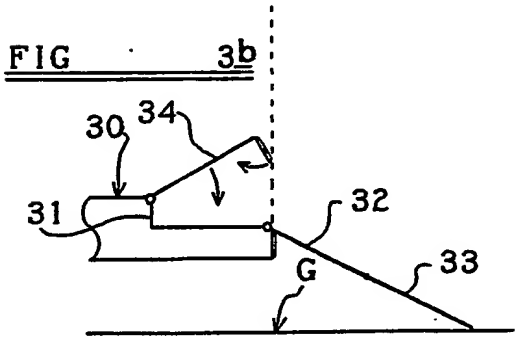
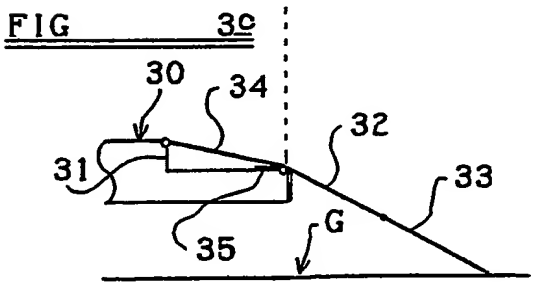
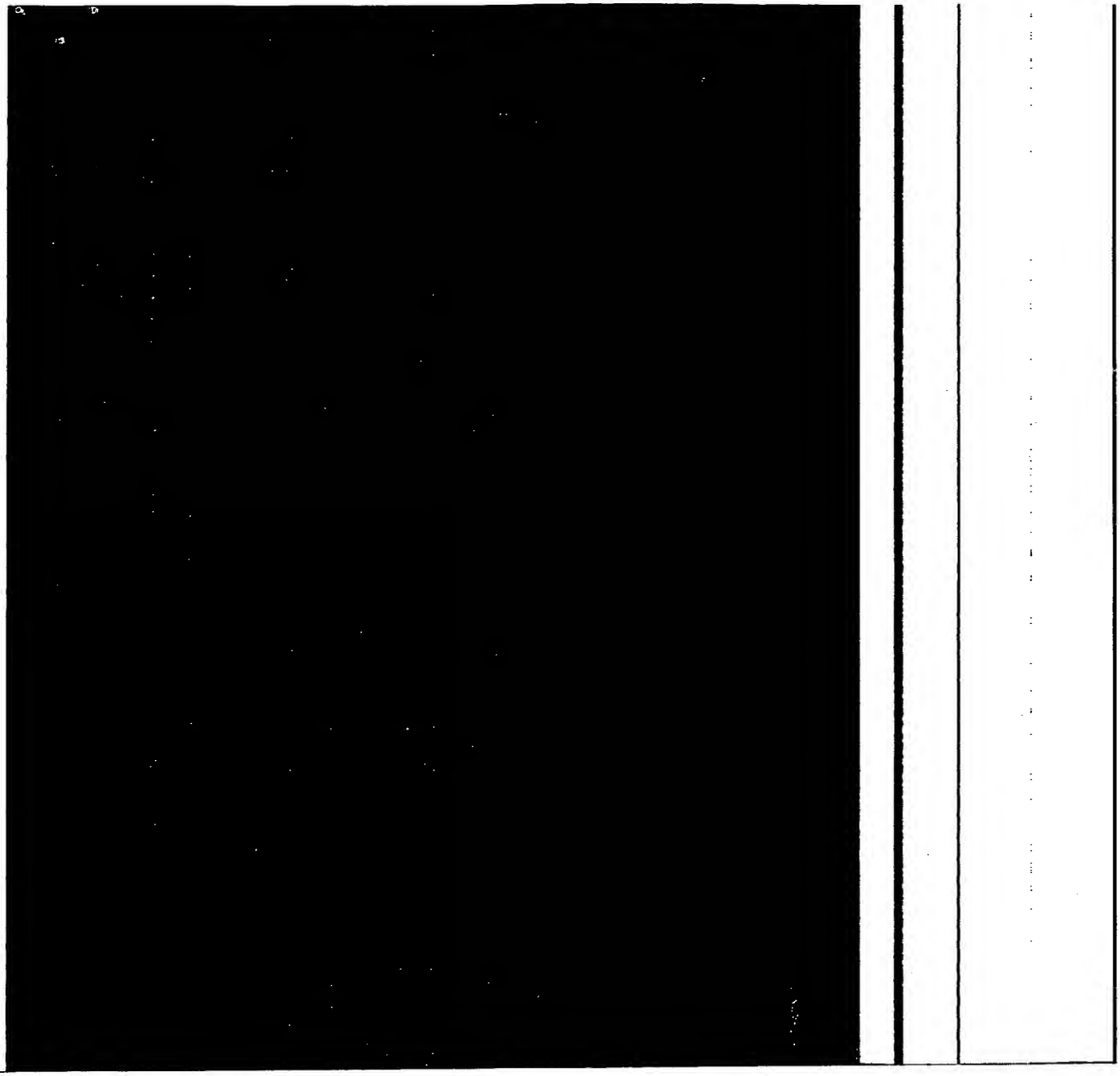


FIG 3c





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Title: "Wheelchair access systems for vehicles"

Description of the invention

This invention relates to a wheelchair access system for vehicles, particularly such as taxi cabs, private hire cars and private cars.

Where such a vehicle is adapted to receive a wheelchair borne passenger, generally it is desirable to provide some form of ramp for wheelchair access as the height of the step up from the ground to the vehicle door sill is

substantially flush with the adjacent floor surface area. The recess preferably includes a downwardly and outwardly inclined surface which forms an inboard extension of the ramp formed by said ramp member.

Alternatively, the upper side of the recess may normally be closed by a part of the floor structure which defines the floor surface immediately inward of the door and is arranged to drop down when the ramp member is in its operative position and form an internal step or ramp.

The ramp member may include an extension member which is movable from a stowed position to an operative position in which it forms an extension of the ramp member.

Most preferably, the ramp member in its operative position forms an intermediate section of a ramp which extends substantially without interruption from a position spaced inwardly of the vehicle doorway, through the doorway and outwardly towards the ground.

In a particularly preferred embodiment, the access system comprises a ramp having three sections foldably connected to one another such that the in-use outermost section, when in the storage position, forms a part of the floor surface.

The ramp member may extend across substantially the entire width of the vehicle doorway, and may also in that case include a centrally disposed recess which defines a footstep with a substantially horizontal tread when in the operative position. Alternatively, the system may comprise a pair of such ramp member spaced apart along the door sill so as to provide in the operative position a pair of ramps spaced apart by a distance appropriate to enable a wheelchair to travel thereon.

The ramp member may be movable between its stowed and operative positions manually, or power assisted means, e.g. hydraulic or electric, may be provided.

The invention also resides in a vehicle equipped with such a wheelchair access system.

The invention will now be described by way of example with reference to the accompanying drawings which diagrammatically illustrate a range of alternative embodiments in stowed, intermediate (where appropriate) and operative positions.

In a preferred embodiment as illustrated in Figures 1a to 1c, the floor structure 10 of a vehicle is formed with an upwardly open recess 11 which affords a downwardly and outwardly inclining face 11a, and the recess houses a hinged ramp member 12 carrying a hinged extension plate 13 which is normally arranged flush with the floor surface as shown in Figure 1a. By lifting the extension plate 13 upwardly and outwardly as illustrated in Figure 1b, the member 12 can be pivoted to an operative position as shown in Figure 1c in which the in-situ uppermost surface 12a forms the central section of a ramp defined by the inclined face 11a within the vehicle, the face 12a of the member 12 and the extension plate 13 which may engage the ground surface (G).

Conveniently, where the ramp extends across substantially the full width of the vehicle door, the ramp member 12 is formed with a foot recess 14 in a central position, and optionally a pair of fold-down legs 15 may be provided within the member 12 on either side of the foot recess 14.

In a further embodiment as illustrated in Figure 2a, the floor structure 20 is formed with a recess 21 which is of increasing depth in an outward direction, and a wedge-shaped ramp member 22 is normally housed within such recess. As in the previously described embodiment, the ramp member is hingedly connected to the floor structure and may be moved to an operative position as illustrated in Figure 2b in which its in-situ upper surface forms a downward and outward extension of the downwardly inclined surface 21a of the recess, in the manner of a ramp. Optionally, the ramp member 22 may accommodate a pull-out extension plate 23 which drops down into an inclined position to form an extension of the ramp substantially to ground level.

Referring now to Figure 3a, this shows a further embodiment in which the floor structure 30 is formed with a recess 31 which is normally covered by a

floor section 34 to which the door sill 35 is connected. The floor section 34 is hingedly connected to the floor structure and may be raised to gain access to the recess 31 which houses a ramp member 32 and optionally a ramp extension 33. The member 32 and extension 33 may be slidably arranged so as to pull out from the recess 31 and drop down to form an inclined ramp as illustrated in Figure 3b, or alternatively the member 32 and extension 33 may be hingedly connected so as to be capable of unfolding into the position shown. To complete the ramp, the door sill section 35 is folded inwardly beneath the floor section 34, which is then lowered to form an upper section of the ramp as illustrated in Figure 3c.

It is to be noted that where the access system includes a recess in the floor structure, so that the access ramp extends through the vehicle doorway, and this affords increased headroom within the doorway, and serves to reduce the gradient. A three-section ramp as illustrated is particularly convenient insofar as in each case a relatively long ramp with a gentle gradient is established without intruding unacceptably far into the vehicle, i.e. terminating well short of the centre line of the vehicle in the case of a taxi cab for example, so that there is ample space afforded by the floor structure at the top of the ramp to accept the wheelchair whilst the ramp is returned to its stowed position before the wheelchair is finally placed in the required position for transport.

CLAIMS:-

1. A wheelchair access system for a vehicle comprising a ramp member which is normally disposed in a storage position in a recess afforded by the floor structure of the vehicle in which it is fitted and is movable from such storage position to an operative position in which it extends externally of the vehicle adjacent to an axis door thereof at a downward inclination so as to form a ramp extending from the floor structure at least partially towards the ground, said recess providing a temporarily lowered floor section adjacent to the vehicle door so as to give increased headroom in the doorway.

2. A wheelchair access system according to Claim 1 wherein said recess defines an inclined ramp surface which forms a continuation of the ramp afforded by said ramp member.

3. A wheelchair access system according to Claim 1 or Claim 2 wherein the recess is open at its upper side and the ramp member in its storage position forms part of the floor surface within the vehicle substantially flush with the adjacent floor surface area.

4. A wheelchair access system according to Claim 3 wherein the recess includes a downwardly and outwardly inclined surface which forms an inboard extension of the ramp formed by said ramp member.

5. A wheelchair access system according to Claim 1 or Claim 2 wherein the upper side of the recess may normally be closed by a part of the floor structure which defines the floor surface immediately inward of the door and is arranged to drop down when the ramp member is in its operative position and form an internal step or ramp.

6. A wheelchair access system according to anyone of the preceding claims wherein the ramp member includes an extension member which is movable from a stowed position to an operative position in which it forms an extension of the ramp member.

7. A wheelchair access system according to Claim 6 wherein the ramp member in its operative position forms an intermediate section of a ramp which extends substantially without interruption from a position spaced inwardly of the vehicle doorway, through the doorway and outwardly towards the ground.

8. A wheelchair access system according to Claim 7 wherein the ramp comprises three sections foldably connected to one another such that the in-use outermost section, when in the storage position, forms a part of the floor surface.

9. A wheelchair access system according to anyone of the preceding claims wherein the ramp member extends across substantially the entire width of the vehicle doorway.

10. A wheelchair access system according to Claim 9 wherein the ramp member includes a centrally disposed recess which defines a footstep with a substantially horizontal tread when in the operative position.

11. A wheelchair access system according to anyone of Claims 1 to 8 comprising a pair of said ramp members spaced apart along the door sill so as to provide in the operative position a pair of ramps spaced apart by a distance appropriate to enable a wheelchair to travel thereon.

12. A vehicle equipped with a wheelchair access system according to anyone of the preceding claims.

13. A wheelchair access system constructed and operating substantially as hereinbefore described with reference to and as shown in Figures 1a to 1c of the accompanying drawings.

14. A wheelchair access system constructed and operating substantially as hereinbefore described with reference to and as shown in Figures 2a to 2b of the accompanying drawings.

15. A wheelchair access system constructed and operating substantially as hereinbefore described with reference to and as shown in Figures 3a to 3c of the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

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Relevant Technical fields

(i) UK Cl (Edition L) B7B (BAA, BAD) B7L (LK)
B8E (E23)

(ii) Int Cl (Edition 5) B60P B61D A61G

Search Examiner

PAT EVERETT

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

Date of Search

6 AUGUST 1993

Documents considered relevant following a search in respect of claims 1-15

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 0481768 (BAHNER)	1,2,9
X	GB 0384810 (MILES) Figures 1, 2	1-3,5-9
X	EP 0217265 A (ALSTHOM) Figures 1 and 4	1,3-5
X	EP 0416539 A (FEITH)	1

Category	Identity of document and relevant passages	Relevar to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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